JUNCTION BOX

Related Application

[0001] This application is a continuation-in-part of United States Patent Application No. 10/294652, filed on 15 November 2002 and entitled "**Junction Box**".

Technical Field

[0002] The invention pertains to apparatus for housing electrical connections and/or other electrical components. Particular embodiments of the invention have application housing terminal connectors for telephone, cable television and/or other telecommunications lines.

Background

[0003] In the telecommunications industry, it is often necessary to electrically connect and/or reconfigure connections by way of which telecommunications signals are provided to subscribers. Such connections may have to be made or to be reconfigured to provide service to one or more subscribers in a building, a group of buildings or individual units within a building.

[0004] It is desirable to provide a plurality of relatively easily replaceable, interchangeable and reconfigurable connections in a single location (for a particular building, for example), such that connections and/or changes to connections may be made with a minimum effort. A device capable of providing one or more electrical connections is referred to herein as a "terminal connector".

[0005] There is a general desire to locate terminal connectors in weather resistant housings which may be conveniently located in outdoor locations, such that connections may be made, changed and/or

reconfigured by service technicians of telecom companies or other service providing organizations without having to enter buildings.

[0006] It may also be desirable to install such terminal connector housings in a recess of a building wall between building wall layers. Such installation causes an interruption in the external layer(s) of buildings. If a recess is not adequately sealed, moisture may intrude into or between the layers of the building wall, damaging the building wall over time and eventually resulting in the need for repair or replacement of the building wall. Moisture or other foreign material may also intrude past the housing into the building recess and possibly into the building itself. For these reasons, there is a general desire to provide housings which deter inward movement of and prevent or minimize the intrusion of moisture between building wall layers. It is desirable that moisture or water accumulating between the housing and the wall be conveyed away from the housing past the most exterior wall layer.

Summary of the Invention

[0007] A junction box for receiving electrical cables and for housing electrical components is disclosed. The apparatus comprises a base member and a lid member positionable over the base member to form an enclosure. The base member may have a recessed region and the lid member may be positionable over the recessed region of the base member. The lid member and the base member may be coupleable on one side by one or more hinges. A plurality of concentric lower flanges may extend from a lower surface of the base member, such that a first cable conduit may be slidably engaged to one of the plurality of lower flanges. A plurality of concentric upper flanges may extend from an upper surface of the base member, such that a second cable conduit may be slidably engaged to one of the plurality of upper flanges. One or

more upper knock-out elements may be located on the upper surface of the base member inside a diameter of the outermost one of the plurality of concentric upper flanges. The one or more upper knock-out elements may be removable from the base member to form an upper aperture therein, such that a cable may extend from an interior of the second cable conduit through the upper aperture and into the enclosure.

[0008] The junction box may comprise a skirt flange for conveying, in an exterior direction, moisture on one or more surfaces thereof. The skirt flange may be spaced apart from the lid member and may encircle a perimeter of at least one of the lid member and base member.

[0009] The skirt flange may comprise a bottom drainage flange which projects downwardly and in an exterior direction from beneath the base member. The skirt flange may additionally or alternatively comprise a pair of side portions which project in an exterior direction from opposite sides of the base member and which extend upwardly from the bottom drainage flange. The side portions of the skirt flange may extend upwardly from the bottom drainage at locations that are transversely inward of the opposing side edges of the bottom drainage flange. The skirt flange may additionally or alternatively comprise an upper portion which projects downwardly and in an exterior direction from above the base member and which may extend transversely between the pair of side portions.

[0010] The bottom drainage flange may comprise one or more dams which project upwardly from an upper surface of the bottom drainage flange for limiting movement of moisture in a transverse direction along the upper surface of the bottom drainage flange. The one or more dams may comprise a pair of dams which project upwardly

from opposite side edges of the bottom drainage flange for preventing moisture received on the upper surface of the bottom drainage flange from traveling transversely past the side edges of the bottom drainage flange.

[0011] The bottom drainage flange may comprise a drip lip which projects more sharply downwardly than a remaining portion of the bottom drainage flange.

[0012] When the junction box is mounted within a building wall, the bottom drainage flange, the upper portion, or both the bottom drainage flange and the upper portion may project in an exterior direction past an exterior-most wall layer. When the junction box is mounted within a building wall having one or more wall layers, at least one of the one or more wall layers may abut against at least a portion of the skirt flange.

[0013] The junction box may comprise a mounting flange for mounting the junction box between the layers of a building wall. The skirt flange may project in an exterior direction from the mounting flange. The mounting flange may project vertically, transversely, or both vertically and transversely from the base member. The mounting flange may be fastened to at least one wall layer and may extend between and substantially parallel to a pair of wall layers.

[0014] Further features and applications of specific embodiments of the invention are described below.

Brief Description of the Drawings

[0015] In drawings which depict non-limiting embodiments of the invention:

Figure 1 is an isometric view of a junction box in a closed configuration according to a particular embodiment of the invention;

Figure 2 is an elevated plan view of a front side of the junction box of Figure 1;

Figure 3 is an elevated plan view of a back side of the junction box of Figure 1;

Figure 4 is an elevated plan view of the top of the junction box of Figure 1;

Figure 5 is an elevated plan view of the bottom of the junction box of Figure 1;

Figure 6 is an elevated plan view of a hinged side of the junction box of Figure 1;

Figure 7 is an elevated plan view of a clasp side of the junction box of Figure 1;

Figure 8 is an elevated plan view of the junction box of Figure 1 in an open configuration;

Figure 9 is a sectional view of a particular type of cable adapter mounted to the junction box of Figure 1;

Figure 10 is a partial isometric exploded view showing the clasp assembly of the junction box of Figure 1;

Figure 11 is an elevated plan view of the junction box of Figure 8 housing a first type of grounding bar;

Figure 12 is an isometric view of the junction box of Figure 11 housing a first type of terminal connector;

Figure 13 is an elevated plan view of the junction box of Figure 8 housing a second type of grounding bar;

Figure 14 is an isometric view of the junction box of Figure 13 housing a second type of terminal connector;

Figure 15 is an isometric view of a junction box in closed configuration according to another embodiment of the invention;

Figure 16 is an elevated plan view of a front side of the junction box of Figure 15;

Figure 17 is an elevated plan view of a back side of the junction box of Figure 15;

Figure 18 is an elevated plan view of the top of the junction box of Figure 15;

Figure 19 is an elevated plan view of the bottom of the junction box of Figure 15;

Figure 20 is an elevated plan view of a hinged side of the junction box of Figure 15;

Figure 21 is an elevated plan view of a clasp side of the junction box of Figure 15;

Figure 22 is an elevated plan view of the junction box of Figure 15 in an open configuration;

Figure 23 is an isometric view of a junction box in a closed configuration according to a further embodiment of the invention;

Figure 24 is an elevated plan view of a front side of the junction box of Figure 23;

Figure 25 is an elevated plan view of a back side of the junction box of Figure 23;

Figure 26 is an elevated plan view of the top of the junction box of Figure 23;

Figure 27 is an elevated plan view of the bottom of the junction box of Figure 23;

Figure 28 is an elevated plan view of a hinge side of the junction box of Figure 23 mounted between the layers of a building wall;

Figure 29 is an elevated plan view of a clasp side of the junction box of Figure 23 mounted between the layers of a building wall; and

Figures 30A and 30B are isometric views of the junction box of Figure 23 incorporating circular flanges for mounting cable conduits.

Detailed Description

[0016] Throughout the following description, specific details are set forth in order to provide a more thorough understanding of the invention. However, the invention may be practiced without these particulars. In other instances, well known elements have not been shown or described in detail to avoid unnecessarily obscuring the invention. Accordingly, the specification and drawings are to be regarded in an illustrative, rather than a restrictive, sense.

[0017] The invention disclosed herein relates to a junction box apparatus for housing one or more terminal connectors and/or other electrical components. Although it may be used for a wide variety of applications, the junction box of the present invention is particularly well suited for housing surge protecting terminal connectors, which are widely used in the telecommunications industry. The junction box is designed with a number of features making it suitable for outdoor use. Such features include: a locking clasp mechanism that simultaneously provides security for the junction box and dual accessibility to the junction box for both subscribers and service technicians; a terminal connector platform located on the junction box lid to provide easy access to terminal connectors housed in the junction box, such that connections may be safely and easily made, changed and/or reconfigured; a plurality of "knock-out" apertures at various locations on the base of the junction box that provide access to the junction box for various types of cables and conduits; mounting features located on the base of the junction box (i.e. away from the terminal connectors and/or other components) which permit the junction box to be mounted

to the outside of a building or other support structure, or between the layers of a wall of a building or other support structure, via a variety of fasteners; sealed cable entry and water drainage features that help to weatherproof the junction box and the terminal connectors and/or other components housed therein; mounting features located on the base of the junction box which permit the junction box to be mounted within a recess of a building between wall layers; and water drainage features that help to convey moisture away from the building recess. These features may be provided individually or in any combination.

[0018] Throughout the following description, the term "cable" is used to describe any wire, conduit, cable or the like which is capable of carrying electrical signals or power. As used in the following description, "cable(s)" may comprise one individual cable or a plurality of individual cables. "Cable(s)" should also be understood to include fiber optic cables and pluralities of individual cables which may be grouped together and enclosed in a single sheath or conduit. In general, cables used to carry telecommunications signals comprise two individual cables, one of which is a ground cable and the other of which is a signal carrying cable. In operation, the junction box of the present invention receives one or more cables and houses one or more terminal connectors (and/or other electrical components). Terminal connectors facilitate connections between the various cables received by the junction box.

[0019] Figures 1 through 7 depict various views of a junction box **10** according to a particular embodiment of the invention in a closed configuration. Figure 8 depicts junction box **10** in an open configuration.

[0020] When junction box **10** is in its closed configuration depicted in Figures 1 through 7, junction box **10** forms a substantially hollow, six

sided enclosure having a front side **14**, a back side **20**, a bottom side **16**, a top side **18**, a clasp side **12** and a hinge side **22**. Preferably, junction box **10** is made out of PVC, another plastic or another suitably non-conducting, waterproof and flame-retardant material.

[0021] Throughout the following description, a number of conventions are employed to simplify the explanation of the invention. Where the invention comprises a plurality of similar elements, the individual elements are referred to using a reference numeral followed by a letter (for example, hinge **44A**) and the group of elements is referred to collectively using the reference numeral alone (for example, hinges **44**). The words "inward" and "inwardly" refer to a direction that extends from the outside of junction box **10** towards the interior of junction box **10**. Similarly, the words "outward" and "outwardly" refer to a direction that extends from the interior of junction box **10** towards the outside of junction box **10**.

[0022] Junction box **10** comprises a base member **24** and a lid member **26**, which are joined to one another on hinge side **22** by a plurality of hinges **44**. Hinges **44** facilitate pivotal movement of lid member **26** relative to base member **24**, such that lid member **26** may swing open from base member **24** on clasp side **12**. In the closed configuration of Figures 1 through 7, clasp assembly **70** may fasten lid member **26** to base member **24** on clasp side **12**. In the illustrated embodiment, the height and width of lid member **26** are slightly larger than the height and width of base member **24**, such that the edges **25** (Figure 8) of base member **24** fit slidably inside the edges **27** of lid member **26** and edges **27** of lid member **26** slidably overlap edges **25** of base member **24**. As shown in Figure 1, the recess inside base member **24** is relatively deep in comparison to that of lid member **26**.

[0023] Figure 3 depicts back side **20** of junction box **10**. Back side **20** comprises a plurality of mounting locations **46**, which may be used to mount junction box **10** to the wall of a building or other suitable support structure (not shown). Screws, bolts or other fasteners (not shown) may extend from the inner surface **270** (Figure 8) of base member **24**, through apertures (not shown) in mounting locations **46** and into or through the support structure. Alternatively, screws, bolts or other fasteners may extend from the support structure, through apertures in mounting locations **46** and into junction box **10**. Preferably, as shown in Figure 3, mounting locations **46** are elongated, such that fasteners may be inserted through mounting locations **46** in a range of positions. Mounting locations **46** may comprise pre-threaded apertures to accept threaded fasteners. Preferably, mounting locations **46** are surrounded by stand-off flanges **42** (Figure 4) that extend outwardly from back side **20**, such that when junction box **10** is mounted to a wall or other support structure, back side **20** of junction box **10** is separated slightly from the support structure. This separation facilitates water drainage between backside **20** and the support structure. In the illustrated embodiment (Figure 3), junction box **10** is formed without apertures in mounting locations **46**. In such embodiments, if required, apertures may be "knocked-out" of mounting locations **46** by driving fasteners through the body of junction box **10** or otherwise.

[0024] Back side **20** of junction box **10** comprises a circularly shaped back aperture **90** (Figure 3). Back aperture **90** facilitates direct access to the interior of junction box **10** for one or more cables (not shown). Typically, although not necessarily, such a cable extends from back side **20** of junction box **10** directly into the building or support structure to which junction box **10** is mounted. Back aperture **90** may comprise a grommet (not shown) which extends around its circular edge, such that when an electrical cable is fed through back aperture **90**,

a seal is formed around the cable. Such a grommet may be made of rubber, silicone or other suitable materials. Preferably, the grommet is made of materials which are elastomeric and waterproof.

[0025] In the illustrated embodiment, back aperture **90** is not in use and, consequently, is filled with a removable plug **94.** Preferably, plug **94** is made out of a material or materials which are elastomeric and waterproof, such as rubber, silicone or plastic. When inserted, plug **94** provides a substantially waterproof seal with the circular edge of back aperture **90**. In some embodiments (not shown), plug **94** may be pierced to provide an aperture therein. When plug **94** is pierced in this manner, it may function as a grommet to form a waterproof seal around a cable inserted through back aperture **90**.

[0026] In other embodiments (not shown), plug **94** may be a "knock-out" element, which may be knocked or punched out from base member **24** to leave a corresponding aperture. A knock-out element, such as knock-out plug **94**, may be implemented, for example, by forming the walls of base member **24**, such that they have relatively thin regions which surround the desired shape of knock-out plug **94**. In this manner, knock-out plug **94** may be removed from base member **24** (if it is desired to run a cable through back aperture **90**) or, alternatively, knock-out plug **94** may be left in place in base member **24** to provide a waterproof wall.

[0027] In this description, an element referred to as a "knock-out" element, may be "knocked-out" or "punched out" from the body of junction box **10** to leave a correspondingly shaped aperture in base member **24** or lid member **26**. Such a knock-out element may be formed integrally with base member **24** or lid member **26** or may be a separate piece, which snaps into base member **24** or lid member **26**.

Such a knock-out element may be implemented, for example, by forming the walls of junction box **10**, such that they have relatively thin regions which surround the desired knock-out element. In addition, the term "knock-out" is used in this description in conjunction with the aperture which may be formed by a knock-out element. For example, in some embodiments, back aperture **90** may be a knock-out aperture, which is formed when circular knock-out plug **94** is removed from base member **24**.

[0028] Referring to Figures 8 and 9, back side **20** of base member **24** may also incorporate an elongated knock-out element **272**. Knock-out element **272** may comprise a semi-circular lower portion **274** and elongated sidewalls **276**, which extend upward toward back aperture **90**. In some embodiments (not shown) knock-out element **272** may actually comprise a plurality of smaller knock-out elements. When plug **94** is knocked-out or removed from back aperture **90** and knock-out element **272** is knocked-out of base member **24**, the resultant elongated aperture **283** in the back side **20** of base member **24** is shaped to facilitate connection to a particular type of telecommunications cable adapter **282**. As shown in Figure 9, cable adapter **282** receives a conduit **284** containing cable **286** and has its own enclosed space **288** in which cable **286** has an elbow **289**. Elbow **289** causes cable **286**, which enters cable adapter **282** from a certain location, to exit cable adapter **282** from a different, spaced apart location.

[0029] Back side **20** of base member **24** may also comprise a plurality of mounting holes **280** which may be used to mount cable adapter **282** to base member **24**. Mounting screws, bolts or other fasteners **285** may be inserted between inner surface **270** of base member **24** and cable adapter **282** through mounting holes **280**. In the illustrated embodiment, mounting holes **280** are slightly elongated on

their vertical dimension (Figure 8) to provide for easier mounting. Mounting holes **280** may be knockout holes.

[0030] Inner surface **270** of base member **24** may comprise a brace **278**, which extends a small distance inwardly from inner surface **270**. In the illustrated embodiment, brace **278** is shaped and positioned to follow the perimeter of knock-out element **272** and back aperture **90** (Figure 8). Brace **278** may provide additional structural support to base member **24**, particularly when elongated aperture **283** is created by removing both knock-out element **272** and back aperture **90** from back side **20** of base member **24**.

[0031] As shown in Figure 8, terminal connector **290** may be mounted on the inner surface **270** of base member **24**. In the illustrated embodiment, terminal connector **290** is mounted to base member **24** using fasteners **292**, which extend from an inner side of terminal connector **290** into mounting holes **48** (Figures 12 and 14). Although the number of fasteners **292** and/or mounting holes **48** may vary in different embodiments, the illustrated embodiment includes four fasteners **292** and four associated mounting holes **48**. In the illustrated embodiment, mounting holes **48** comprise stand-off extensions **296** (Figure 14) that extend inwardly from inner surface **270** of base member **24**. Preferably, mounting holes **48** are threaded.

[0032] In the illustrated embodiment, fasteners **292A** and **292D** are threaded metallic shafts (which are partially inserted into mounting holes **48**) and nuts, which screw onto an inward side of the threaded shafts to hold terminal connector **290** in place. Additionally or alternatively, terminal fasteners **292** may be metallic screws which thread through terminal connector **290** into mounting holes **48**. See for example, fasteners **292B** and **292C**. In general, terminal connector **290** may be

mounted to base member **24** by any suitable means. Preferably, however, fasteners **292** are conductive, so that they may additionally be used to form connections on terminal connector **290**.

[0033] Although mounting holes **48** and terminal connector **290** may be positioned at any suitable location on an inner wall of junction box **10**, the location shown in the illustrated embodiment is preferable, because this location maintains a separation between terminal connector **290** and other cables, components and terminal connectors which may be housed in junction box **10**.

[0034] Terminal connector **290** includes a terminal bar **294**, which extends between fasteners **292** and mounting holes **48**. In typical applications, terminal bar **294** is a conductive grounding bar and extends between all of fasteners **292**, such that all of fasteners **292** are electrically grounded to terminal bar **294**. In alternative embodiments, terminal bar **294** may be non-conductive or may comprise a plurality of smaller terminal bars, which are electrically isolated from one another.

[0035] Cables (not shown) may be connected to terminal connector **290** using a variety of connection means, such as screw connectors, crimp connectors, apertured connectors, "U-shaped" connectors and the like. In the illustrated embodiment, terminal connector **290** is shown with two screw on connectors **298**. In general, however, connectors **298** may be any type of electrical connector.

[0036] Top side **18** of base member **24** comprises a substantially circular top knock-out aperture **50** (Figure 4), which may be used when cable access to junction box **10** is required through top side **18** of base member **24**. In the illustrated embodiment, top knock-out aperture **50** comprises two concentric, substantially circular flanges: outer flange

56 and inner flange **58**. Providing two flanges **56** and **58** permits conduits of different sizes to be mounted to box **10**. If cable access to junction box **10** through top side **18** of base member **24** is required, then a user may remove (i.e. knock-out) one or more knock-out elements **51** of knock-out aperture **50** that are located interior to outer flange **56**.

[0037] Preferably, the outer circumferential surface of outer flange **56** is sized to receive and slidably engage the inner circumferential surface of an industry-standard cable conduit (not shown). For example, the outer circumferential surface of outer flange **56** may be sized to receive the inner circumferential surface of a nominal 2" (50mm) cable conduit. Although 2" steel and PVC cable conduits are widely used in the telecommunications industry, cable conduits made out of almost any material may be mounted to flange **56**. The size of outer flange **56** may be varied to accommodate conduits of different sizes. Gravity and, possibly, frictional contact between the outer surface of outer flange **56** and the inner surface of the cable conduit, act to secure the conduit to junction box **10** and to provide a substantially waterproof seal. When knock-out element **51** of top aperture **50** is knocked-out, a cable may be extended from the cable conduit, through top side **18** of base member **24** and into junction box **10**.

[0038] Inner flange **58** is concentric with outer flange **56** and has an outer circumferential surface sized to receive and slidably engage the inner circumferential surface of a smaller-sized cable conduit (not shown). For example, the outer circumferential surface of inner flange **58** may be sized to slidably engage the inner circumferential surface of a nominal 1¼" (32mm) Schedule 40 PVC cable conduit. Typically, in the telecommunications industry, such 1¼" cable conduits are made from PVC, but cable conduits made from almost any material may be mounted to flange **58**. The size of inner flange **58** may be varied to

accommodate conduits of different sizes. Gravity and the frictional contact between the outer surface of inner flange **58** and the inner surface of the cable conduit act to secure the conduit to junction box **10** and to provide a substantially waterproof seal. When knock-out element **51** of top aperture **50** is knocked-out, a cable may be extended from the cable conduit, through top side **18** of base member **24** and into junction box **10**.

[0039] Additionally, a grommet (not shown) may be provided around the perimeter of knock-out element **51** to form a seal around an inserted cable. Preferably, the grommet is elastomeric and waterproof to help prevent water from entering box **10** by way of top aperture **50**.

[0040] Knock-out elements **51** of top aperture **50** may have different sizes to accommodate different thicknesses of cable. If the cable contained in a conduit is too thick to fit through inner knock-out element **51**, then one or more additional knock-out elements may be removed from top aperture **50** to provide a larger aperture into junction box **10**. For example, top aperture **50** may comprise a plurality of separate knock-out elements (not shown). A first, inner knock-out element (not shown) may be located interior to inner flange **58**, such that when it is knocked out, both flanges **58**, **56** are still present on base member **24**. A second, larger knock-out element (not shown) may be located interior to outer flange **56**, but exterior to inner flange **58**. Such a larger knock-out element may be attached to inner flange **58**, such that when the larger knock-out element is knocked out, inner flange **58** is removed from base member **24**, forming a larger aperture into box **10**.

[0041] Because top aperture **50** may be exposed to rain water, it is desirable to avoid having water or moisture pool on top surface **18** of junction box **10**. When a cable conduit is engaged to the outer

circumferential surface of outer flange **56**, water accumulation is not normally an issue, because water may simply drain away from top aperture **50**. However, when a cable conduit is engaged to inner flange **58**, water may tend to accumulate in the region between inner flange **58** and outer flange **56**. For this reason, outer flange **56** includes a slot **60** that extends upwardly from the top side **18** of base member **24** to the rim of outer flange **56** (Figures 3 and 4). When a cable conduit is engaged to inner flange **58**, slot **60** provides water drainage away from the region between inner flange **58** and outer flange **56**. This drainage helps to prevent water from leaking into junction box **10** through top aperture **50**.

[0042] In the illustrated embodiment, junction box **10** also comprises a circular top aperture cover **52** (Figure 1), which is sized to slidably and frictionally engage the inner circumferential surface of outer flange **56**. Cover **52** prevents water accumulation on top side **18** of junction box **10**. If knock-out element **51** of top aperture **50** has not been knocked-out, then cover **52** prevents water accumulation in the region inside inner flange **58**. If knock-out element **51** of top aperture **50** was initially knocked-out and then, at some later point in time, it is desired to close top aperture **50** (because, for example, there is no longer any need to run cable into junction box **10** through top aperture **50**), then cover **52** may be placed on top aperture **50** to prevent rainwater and other moisture from entering junction box **10**. Top aperture cover **52** may comprise a lip **62**, which extends in a radial direction atop outer flange **56**. Lip **62** helps to move water away from top aperture **50**, and facilitates easy removal of cover **52** from top aperture **50**.

[0043] Bottom side **16** of base member **24** comprises a substantially circular bottom knock-out aperture **30** (Figure 5), which is

used when cable access to junction box **10** is required through bottom side **16** of base member **24**. In the illustrated embodiment, bottom knock-out aperture **30** includes three concentric, circular flanges: outer flange **38**, inner flange **36** and middle flange **37**. If cable access to junction box **10** is required through bottom side **16** of base member **24**, then a user may knock-out a first knock-out element **33** from bottom knock-out aperture **30** and feed the cable through the resulting hole (not shown). Preferably, the first knock-out element **33** of bottom aperture **30** is located inside a diameter of inner flange **36**. A grommet (not shown) may be used to form a seal around an inserted cable. Preferably, the grommet is elastomeric and waterproof, to prevent water from entering box **10** by way of bottom knock-out aperture **30**. In alternative embodiments, bottom aperture **30** may comprise a preformed first aperture (not shown) which is preferably located inside the diameter of inner flange **36**. Such a preformed first aperture may be filled with a an elastomeric plug when not in use.

[0044] Preferably, the inner circumferential surface of outer flange **38** is sized to receive and slidably engage the outer circumferential surface of an industry standard cable conduit (not shown). For example, the inner circumferential surface of outer flange **38** may be sized to receive the outer circumferential surface of a nominal 2" (50 mm) PVC Schedule 40 cable conduit, which is widely used in the telecommunications industry. Cable from the cable conduit may be inserted into junction box **10** through a removed knock-out element **33** of bottom aperture **30**.

[0045] The slidable engagement between the inner surface of outer flange **38** and the outer surface of the cable conduit may provide a friction fit that helps to secure the cable conduit to flange **38**. Bottom aperture **30** also comprises a screw-hole **32**, which extends radially from

an outer circumferential surface of flange **38**. To assist with securing the cable conduit to flange **38**, fastening screw **34** (Figure 1) may be inserted through screw-hole **32** and flange **38** to bear against the outer surface of the cable conduit.

[0046] Middle flange **37** is concentric with outer flange **38** and has an inner circumferential surface sized to receive and slidably engage the outer circumferential surface of a smaller-sized cable conduit (not shown). For example, the inner circumferential surface of middle flange **37** may be sized to slidably engage the outer circumferential surface of a nominal 1" (25 mm) PVC Schedule 40 cable conduit. Such 1" conduits are commonly used in the telecommunications industry. Cable from the cable conduit may be inserted into junction box **10** through a removed knock-out element **33** of bottom aperture **30**.

[0047] The slidable engagement between the inner surface of middle flange **37** and the outer surface of the cable conduit may provide a friction fit that helps to secure the cable conduit to middle flange **37**. Middle flange **37** of bottom aperture **30** also comprises a partial slot **35** (Figures 5 and 14) that extends upwardly from the bottom rim of flange **37** partway through flange **37** toward bottom side **16** of junction box **10**. When a cable conduit is slidably engaged to the inner circumferential surface of middle flange **37**, fastening screw **34** may be inserted through screw-hole **32**, outer flange **38** and partial slot **35** to bear against the outer surface of the cable conduit and to assist with securing the cable conduit to flange **37**. Partial slot **35** may be implemented as a simple aperture (i.e. a screw hole).

[0048] Inner flange **36** is concentric with both outer flange **38** and middle flange **37** and has an outer circumferential surface sized to receive and slidably engage the inner circumferential surface of a

smaller-sized cable conduit (not shown). For example, the outer circumferential surface of inner flange **36** may be sized to slidably engage the inner circumferential surface of a nominal ¾" (18mm) PVC Schedule 40 cable conduit, which is widely used in the telecommunications industry. Cable from the cable conduit may be inserted into junction box **10** through a removed knock-out element **33** of bottom aperture **30**.

[0049] The slidable engagement between the outer surface of inner flange **36** and the inner surface of the cable conduit may provide a friction fit that helps to secure the cable conduit to inner flange **36**. In addition, when a cable conduit is slidably engaged to the outer circumferential surface of inner flange **36**, fastening screw **34** may be inserted through screw-hole **32**, outer flange **38** and partial slot **35** in middle flange **37**. In this manner, screw **34** may be made to bear against the outer surface of the cable conduit to assist with securing the cable conduit to the outer circumferential surface of inner flange **36**.

[0050] As discussed above, conduits mounted to flanges **36, 37, 38** of bottom aperture **30** may be made of PVC or steel, as is common in the telecommunications industry. However, conduits made from almost any material may be secured to flanges **36, 37, 38**.

[0051] Knock-out elements **33** of bottom aperture **30** may have different sizes to accommodate different thicknesses of cable. If the cable contained in a conduit is too thick to fit through inner knock-out element **33**, then one or more additional knock-out elements may be removed from bottom aperture **30** to provide a larger aperture into junction box **10**. For example, bottom aperture **30** may comprise a plurality of separate knock-out elements (not shown). A first, inner knock-out element (not shown) may be located interior to inner flange

36, such that when it is knocked out, all flanges **36**, **37**, **38** are still present on base member **24**. A second, mid-sized knock-out element (not shown) may be located interior to middle flange **37**, but exterior to inner flange **26**. Such a mid-sized knock-out element may be attached to inner flange **36**, such that when the mid-sized knock-out element is knocked out, inner flange **36** is removed from base member **24**, forming a larger aperture into box **10**. A third, large-sized knock-out element (not shown) may be located interior to outer flange **38** and exterior to middle flange **37**. Such a large-sized knock-out element may be attached to middle flange **37** (and possibly, to inner flange **36**), such that when the large-sized knock-out element is knocked out, middle flange **37** (and possibly, inner flange **36**) are removed from base member **24**, forming an even larger aperture into box **10**.

[0052] In the illustrated embodiment, bottom side **16** of base member **24** also includes one or more additional knock-out apertures **40A**, **40B** (Figure 5). When knocked-out, apertures **40** may be used to provide access to junction box **10** for additional cables and/or individual cables. Optionally, apertures **40** may be fitted with an elastomeric and waterproof grommet (not shown) to provide additional protection from water and moisture entering the interior of junction box **10**. In the illustrated embodiment, bottom side **16** of base member **24** also includes an aperture **41** for the drainage of moisture. Aperture **41** may comprise one or more knockout elements. In addition, aperture **41** may be fabricated with a partially preformed aperture therein.

[0053] Hinged side **22** and clasp side **12** of base member **24** may have one or more additional knock-out side apertures **300**, **302** (Figure 8) for admitting additional cables and/or cable conduits into junction box **10**. For example, knock-out side apertures **300**, **302** may be sized to receive 1" (25mm) cable conduits common in the telecommunications

industry. Knock-out side apertures **300, 302** may generally be sized to fit conduits of various sizes. After either side knock-out aperture **300, 302** is removed, its rim may be fitted with an elastomeric and waterproof grommet (not shown) which prevents moisture from entering junction box **10**.

[0054] Locking clasp assembly **70** may be used to secure junction box **10** in its closed configuration (Figures 1 through 7) by securing base member **24** to lid member **26** on clasp side **12** of junction box **10**. Locking clasp assembly **70** may include a plurality of security measures which are useful to facilitate independent access to the interior of junction box **10** by two independent people/organizations and to prevent unwanted vandalism or tampering with the contents of junction box **10**. Access for two different people/organizations is useful, for example, to provide independent access to the service technicians of two different telecom (or other service) organizations technicians or to provide independent access to telecom (or other) service technicians and to telecom subscribers.

[0055] The components and operation of locking clasp assembly **70** are shown in Figure 10. Locking clasp assembly **70** comprises: a lid flange **72**, which extends outwardly from clasp side **12** of lid member **26**; a base flange **76**, which extends outwardly from clasp side **12** of base member **24**; and an intermediate clasp member **74**.

[0056] When junction box **10** is in its closed orientation, lid member **26** and base member **24** are brought together with intermediate clasp member **74** between the two. Intermediate clasp member **74** is fixed to base flange **76** by a locking screw **89** (Figure 8), which screws from intermediate clasp member **74** into base flange **76** through a screw hole **86** (Figure 3). Preferably, as shown in Figure 8, locking screw **89**

has a head that requires a special key or tool to operate. Service technicians from the telecommunications company (or other service organization that owns, maintains or operates the components inside junction box **10**) may be provided with copies of the special key or tool, such that they are the only ones able to operate locking screw **89**. Preferably, aperture **84** in lid flange **72** is sufficiently large to accommodate the head of locking screw **89**, which protrudes through aperture **84** of lid flange **72**, such that the head of locking screw **89** may be accessed with the proper key or tool. Hood extension **82** of lid flange **72** helps to prevent people from tampering with locking screw **89**.

[0057] In addition to being mounted to base flange **76**, intermediate clasp member **74** may be fixed to lid flange **72** by a conventional screw **88** (Figure 1). Screw **88** extends from lid flange **72** into intermediate clasp member **74** through screw hole **78**. Clasp assembly **70** maintains junction box **10** in its closed orientation, because locking screw **89** secures intermediate clasp member **74** to base flange **76** and conventional screw **88** secures intermediate clasp member **74** to lid flange **72**.

[0058] In the closed orientation, a subscriber (or other user) may lock lid flange **72** to intermediate clasp member **74** by inserting a conventional key or combination padlock (not shown) through locking hole **80**. The padlock prevents unauthorized entry into junction box **10**, because it locks lid flange **72** to intermediate flange member **74**. With locking screw **89** locking intermediate clasp member **74** to base flange **76**, lid member **26** may not be separated from base member **24**. When a subscriber (or other user) wants to access junction box **10**, they simply unscrew conventional screw **88** from screw hole **78** and remove their padlock from hole **80**, detaching lid flange **72** from intermediate flange

member **74**. In this manner, lid member **26** is allowed to swing away from base member **24**, leaving intermediate clasp **74** attached to base flange **76** via locking screw **89**.

[0059] A service technician (i.e. a second user) with the special key or tool required to operate the locking screw **89** may independently open junction box **10**, even though a lock has been placed through hole **80**. Using the special tool, the service technician may unscrew locking screw **89** through hole **84** in lid flange **72**, such that intermediate clasp member **74** may be separated from base flange **76**. In this manner, junction box **10** may be opened by separating lid member **26** from base member **24**, leaving intermediate clasp **74** attached to lid flange **72** by screw **88** and the padlock inserted through hole **80**.

[0060] The above described dual locking mechanism of clasp assembly **70** provides the advantage that junction box **10** is always locked and is secure from tampering. The dual opening mechanism of clasp assembly **70** is advantageous, because a first user (such as a subscriber) may independently access junction box **10**. Such access to junction box **10** may allow a subscriber to perform simple maintenance or minor changes to the connections in junction box **10** without requiring the presence of a service technician. The dual opening mechanism of clasp assembly **70** has the additional advantage that a service technician, may also independently access junction box **10'** without requiring the subscriber to remove their lock from hole **80**. The service technician may then make more substantial changes or repairs to the connections and/or other components contained in junction box **10**. The dual independent access clasp assembly **70** may also permit dual independent access to technicians from two of more different service providing organizations, such as a telecom company and a cable company, for example.

[0061] As depicted in Figure 8, a terminal connector platform **204** may be mounted to the inner surface **250** of lid member **26** by fasteners **206**. Fasteners **206** may be screws which screw into screw holes (not shown) formed integrally on inner surface **250** of lid member **26**.

[0062] Junction box **10** may house various types of terminal connectors and/or other electrical components, which may be mounted on platform **204** or directly on inner surface **250** of lid member **26**. In the illustrated embodiment of Figure 8, terminal connector platform **204** comprises a number of features designed to accommodate various types of terminal connectors or other components, which may be mounted thereon. These features are shown in Figures 11 and 12, which depict a first type of grounding bar **216** and a first type of terminal connector **200**, and to Figures 13 and 14, which depict a second type of grounding bar **230** and a second type of terminal connector **202**. Typically (although not necessarily), terminal connectors, such as terminal connectors **200**, **202**, are provided by the telecommunications company or other service providing organization that owns and/or maintains junction box **10** and/or operates the services requiring junction box **10**.

[0063] As shown in Figure 8, platform **204** may comprise a plurality of apertures **208**, which may be used for mounting various types of terminal connectors and/or other electrical components (not shown) to lid member **26** of junction box **10**. Apertures **208** may also be used as additional or alternative mounting apertures through which fasteners (not shown) may extend to mount platform **204** to inner surface **250** of lid member **26**.

[0064] Platform **204** may also comprise a plurality of tie strap brackets **241** (Figure 8), which may be used (in conjunction with tie straps) to restrain cables on the inside of junction box **10**. Preferably, tie strap brackets **241** are positioned at spaced apart locations on platform **204**.

[0065] Preferably, platform **204** comprises a screw hole **214**, which is surrounded by a stand-off flange **212** that projects inwardly from platform **204** (Figure 8). Screw hole **214** and stand-off flange **212** may be used to mount and support different types of grounding bars. Such grounding bars may provide a common ground connection to terminal connectors housed in junction box **10**.

[0066] Figure 11 depicts a first type of grounding bar **216** which is used in conjunction with terminal connectors **200** of Figure 12. Referring to Figures 8 and 11, elevated section **217B** of grounding bar **216** extends inwardly from the base of grounding bar **216** to fit over stand-off flange **212** and is mounted to stand-off flange **212** by a threaded fastener (not shown) inserted into screw hole **214**. Grounding bar **216** is also mounted to platform **204** by fasteners **220**, which screw into screw holes **210** of platform **204**.

[0067] As shown in Figures 11 and 12, grounding bar **216** comprises three elevated sections **217A**, **217B**, **217C**, which extend inwardly from the base of grounding bar **216.** Terminal connectors **200** may be grounded and fastened to elevated sections **217** of grounding bar **216**. Terminal connectors **200** may comprise metallic mounting/grounding brackets **222**, each of which may be fastened to an associated one of elevated sections **217** by fasteners (not shown). Such fasteners may comprise conventional metallic threaded studs and nuts. Additionally or alternatively, such fasteners may support other types of electrical connectors, such as tab connectors, screw connectors, crimp connectors and the like. In general, any type of electrical connector capable of connecting to the fasteners or connecting directly to grounding bar **216** may be used.

[0068] In operation, telecommunications cables entering junction box **10** may be connected to one another by connecting their ground

wires to the common grounding bar **216** and by connecting their respective signal wires to connectors **224, 226** on either side of a terminal connector **200**. In the illustrated embodiment, connectors **224, 226** are screw type connectors. In general, connectors **224, 226** may be any type of electrical connector.

[0069] The location of terminal connectors **200** on lid member **26** of junction box **10** facilitates easy connection and changing of connections. When junction box **10** is opened terminal connectors **200** and their connectors **224, 226** stand out from inner surface **250** of lid member **26** rather than being recessed on the inside of base member **24**. When junction box **10** is closed, terminal connectors **200** are housed in the relatively deep recess of base member **24**.

[0070] Figure 13 depicts a second type of grounding bar **230**, which is used in conjunction with the terminal connectors **202** of Figure 14. Referring to Figures 8, 13 and 14, platform **204** may comprise a slot **234** and a pair of brackets **236** located at either end of slot **234**. Grounding bar **230** may be inserted into slot **234** in an orientation that is substantially orthogonal to platform **204** and each end of grounding bar **230** may be inserted through a corresponding one of brackets **236**. In this manner, slot **234** and brackets **236** help to secure grounding bar **230** in place on platform **204**. Transversely extending tab **232** of grounding bar **230** extends over and is mounted to stand-off flange **212** by a fastener (not shown), which may be threadably inserted into screw hole **214**.

[0071] As shown in Figures 13 and 14, grounding bar **230** comprises a plurality of inwardly projecting members **238**, one of which corresponds with each terminal connector **202**. Although the number of terminal connectors **202** and inwardly projecting members **238** may vary, the illustrated embodiment depicts six terminal connectors **202**. Each of terminal connectors **202** has a grounding hood (not shown) on a

first end thereof. The grounding hood of each terminal connector **202** fits slidably over a corresponding one of inwardly projecting members **238** to form a friction fit with the inwardly projecting member **238**. The friction fit between inwardly projecting members **238** and the grounding hood of terminal connectors **202** establishes the ground connection for terminal connectors **202** and assists in mounting the first end of terminal connectors **202** to platform **204**. As best seen in Figure 13, platform **204** may comprise a plurality of apertures **240**. Apertures **240** may be sized, positioned and shaped, such that specially designed legs (not shown) on a second end of terminal connectors **202** may project through apertures **240** and extend under platform **204** to secure the second end of terminal connectors **202** to lid member **26**.

[0072] Each of terminal connectors **202** comprises two specialized connectors **242, 244** which may be specifically designed to receive the signal carrying wires of conventional telecommunications cables (not shown). In operation, telecommunications cables entering junction box **10** may be connected to one another by connecting their ground wires to the common grounding bar **216** and by connecting their respective signal carrying wires to specialized connectors **242, 244**.

[0073] The location of terminal connectors **202** on lid member **26** of junction box **10** facilitates easy connection and changing of connections. When junction box **10** is opened, terminal connectors **202** and their connectors **242, 244** stand out from inner surface **250** of lid member **26** rather than being recessed on the inside of base member **24**. When junction box **10** is closed, terminal connectors **202** are housed in the relatively deep recess of base member **24**.

[0074] Figures 15-22 depict a junction box **10'** according to an alternative embodiment of the invention. Junction box **10'** is substantially similar to junction box **10** of Figures 1-14, except that junction box **10'** is designed to be mounted in the interior of a wall.

Typically, although not necessarily, junction box **10'** is mounted to the interior of a wall during the wall's fabrication. As junction box **10'** is similar to junction box **10** (Figures 1-14), the features of junction box **10'** are depicted and referred to in this description using the same reference numerals as the similar features of junction box **10** followed by a "prime" symbol (').

[0075] Using fasteners **23'**, flanges **28A'**, **28B'** (collectively, **28'**) are respectively mounted to junction box **10'** on its clasp side **12'** and hinge side **22'**. Although fasteners **23'** are depicted as nuts and bolts, any suitable fasteners may be used to mount flanges **28'** to junction box **10'**. Junction box **10'** includes a pair of holes **29'** on each of clasp side **12'** and hinge side **22'**. Fasteners **23'** extend through flanges **28'** and holes **29'** to mount flanges **28'** to junction box **10'**. As shown in Figures 20 and 21, holes **29'** may be elongated to provide positional adjustability for flanges **28'** and corresponding positional adjustability of junction box **10'** within a wall.

[0076] Flanges **28'** are provided for mounting junction box **10'** to the framework of a wall. A variety of mounting schemes are possible. For example, flanges **28'** may be fastened to the wooden or metal studs of a wall. Junction box **10'** may be oriented such that lid member **26'** opens towards the exterior of a building or lid member **26'** opens towards the interior of a building. Flanges **28'** may be made of metal or other suitable materials.

[0077] Junction box **10'** comprises a top aperture **50'**, a bottom aperture **30'**, a back aperture **90'**, an elongated back aperture **272'** and a pair of side apertures **300'**, **302'**. Preferably, these apertures **50''**, **30''**, **90''**, **272''**, **300''**, **302''** are knock-out apertures and are substantially similar to the corresponding knock-out apertures of junction box **10** described above. Each of these apertures may also comprise a plurality of knock-out elements, such that a variety of sizes of apertures may be

formed. In the illustrated embodiment of Figures 15-22, upper aperture **50'** and lower aperture **30'** are shown without concentric flanges **56**, **58** and **36**, **37**, **38** which respectively surround upper aperture **50** and lower aperture **30** of junction box **10**. However, in alternative embodiments (not shown), upper aperture **50'** and lower aperture **30'** may be constructed with concentric flanges that may be substantially similar and function in a manner that is substantially similar to concentric flanges **56**, **58** and **36**, **37**, **38**.

[0078] Other features of junction box **10'** (Figure 22) may be substantially similar to the features of junction box **10** (Figures 8, 11-14). Accordingly, such features of junction box **10'** are not described further herein.

[0079] Figures 23-30 depict a junction box **10"** according to another alternative embodiment of the invention. Junction box **10"** is designed to be mountable between the layers of a building wall **522''**. For the purposes of describing junction box **10"** of Figures 23-30, the term "exterior direction" is used to refer to a direction which extends from an interior of wall **522"** towards the exterior of wall **522"** (see arrow **556"** of Figures 28, 29) and the term "exterior-most" is used to refer to a portion of an object that extends the furthest in the exterior direction. Similarly, the term "interior direction" is used to refer to a direction which extends from an exterior of wall **522"** towards the interior of wall **522"** (see arrow **558"** of Figures 28, 29) and the term "interior-most" is used to refer to a portion of an object that extends the furthest in the interior direction. Advantageously, as will be explained further below, junction box **10"** comprises a number of features designed to deter movement of moisture in the interior direction, to prevent or minimize the intrusion of moisture between building wall layers and to convey moisture in the exterior direction away from junction box **10"** and past the exterior-most wall layer. As junction box **10"** comprises many features that are the same as or similar to features

of junction box **10**, the features of junction box **10"** are depicted and referred to in this description using the same reference numerals as the corresponding features of junction box **10**, followed by a "double prime" symbol (").

[0080] As shown in Figures 28, 29, junction box **10"** may be mounted between layers **522A"**, **522B"** of building wall **522"**, such that its base **24"** extends in an interior direction into a building recess **523"** and its lid **26"** opens in an exterior direction for access from an outdoor location. Such outdoor access permits connections to be made, changed and/or reconfigured by service technicians of telecom companies or other service providing organizations without having to enter the building. Building recess **523"** may be an aperture (not shown), such that front side **14"** of junction box **10"** is accessible from the exterior of the building and back side **20''** is accessible from the interior of the building. Typically, although not necessarily, junction box **10"** is mounted between the surface layers **522A"**, **522B"** of building wall **522"** during the wall's fabrication. External wall layer **522B''** may be a siding or cladding layer and internal wall layer **522A''** may be a sheathing layer, for example. The illustrated embodiment of Figures 28,29 depicts junction box **10''** installed in a vertical wall **522''**. In general, however, building wall **522"** may generally extend in any direction and need not be vertical. Accordingly, directional words used in this description should be given broad scope and not be interpreted narrowly.

[0081] As best seen in Figures 23-25, base member **24''** of junction box **10''** comprises a mounting flange **534''** which is substantially planar and which projects vertically and transversely from base member **24''** to form an outer perimeter of base member **24''**. Preferably, mounting flange **534"** is formed integrally with base member **24"** and is impervious to moisture so as to provide a barricade, which tents to prevent the flow of moisture in an inward direction

through wall **522"**. For example, mounting flange **534"** and base **24"** may be injection molded in the same process. Mounting flange **534''** need not surround base member **24''** entirely, but may alternatively comprise a number of spaced-apart flanges (not shown) which extend vertically outwardly and/or transversely outwardly from base member **24''**. Mounting flange **534''** preferably comprises a plurality of apertures **535A''**, **535B''**, **535C''**, **535D''** (collectively, **535''**) which penetrate mounting flange **534''** at spaced-apart locations. Fasteners **536''** (Figures 28,29) may be inserted through apertures **535''** to mount junction box **10''** to one or both of layers **522A''**, **522B''** of building wall **522''**. Although depicted as screws in Figures 28,29, fasteners **536''** may generally comprise any type of fastener, including, for example, rivets, nails, staples, or the like.

[0082] As shown in Figures 23-30, junction box **10''** comprises a skirt flange **521''**. Skirt flange **521''** projects in an exterior direction from mounting flange **534''** and functions to convey moisture received on its surfaces away from building recess **523''** and out from within building wall **522''**. Preferably, skirt flange **521''** is spaced apart from lid member **26''** by a gap **505"**. Skirt flange **521''** may encircle a perimeter of lid member **26''**, of base member **24''**, or of both lid member **26''** and base member **24''**. Preferably, skirt flange **521"** is formed integrally with mounting flange **534"** and is impervious to moisture so as to provide a barricade, which tents to prevent the flow of moisture in an inward direction through wall **522"**. For example, skirt flange **521"** and mounting flange **534"** may be injected molded in the same process.

[0083] In the illustrated embodiment, skirt flange **521''** comprises an upper portion **538''**, a pair of side portions **539A''**, **539B''** and a bottom drainage flange **524''**. Upper portion **538''** projects downwardly and in an exterior direction from above base member **24''**, side portions **539A''**, **539B''** are vertically oriented and project in an

exterior direction from opposite sides of base member **24''**, and bottom drainage flange **524''** projects downwardly and in an exterior direction from beneath base member **24''**. In the illustrated embodiment, upper portion **538''** and bottom drainage flange **524''** extend further in an exterior direction than side portions **539''**. Preferably, side portions **539''** are sized to allow pivotal movement of lid member **26''** relative to base member **24''** on hinges **44''** (Figure 24). Bottom drainage flange **524''** may be wider in the transverse direction than upper portion **538''**. Bottom drainage flange **524''** may extend to the transverse edges of mounting flange **534''**, as shown in the illustrated embodiment. Side portions **539''** of skirt flange **521''** preferably extend upwardly from transversely inward locations on bottom drainage flange **524''** to meet upper portion **538''** of skirt flange **521''**. In alternative embodiments, the transverse sides of bottom drainage flange **524''** may be vertically aligned with side portions **539''** of skirt flange **521''**.

[0084] Although Figures 23-30 show skirt flange **521''** as projecting in an exterior direction from mounting flange **534''**, skirt flange **521''** may alternatively be attached to junction box **10''** directly, via a bracket, or by other suitable means. In other alternative embodiments, skirt flange **521''** may attach to building recess **523''**.

[0085] As shown in the illustrated embodiment of Figures 23-30, bottom drainage flange **524''** may comprise dams **542''** that extend upwardly from the transverse sides of its upper surface. In some embodiments, dams **542''** may be provided at alternative and/or additional transverse locations. For example, dams **542''** may be located between side portions **539''** of skirt flange **521''** and the side edges of bottom drainage flange **524''** or dams **542''** may be vertically aligned with side portions **539''**. As shown in Figures 23-30, bottom drainage flange **524''** may also comprise an outer drip lip **543''** at its exterior-most edge. Outer drip lip **543''** projects more sharply

downwardly than does the remaining portion of bottom drainage flange **524''**.

[0086] As shown in Figures 28, 29, junction box **10''** is preferably installed between layers **522A''**, **522B''** of building wall **522''** during the building's construction. Preferably, junction box **10''** is installed in recess **523''** by mounting base member **24''** to internal wall layer **522A''** using fasteners **536''** which project through apertures **535''** in mounting flange **534''** and into one or both of wall layers **522A"**, **522B"**. Fasteners **536''** may not require apertures **535''** and may simply be driven through mounting flange **534''**.

[0087] Those skilled in the art will appreciate that additional and/or alternative techniques may be used to mount base member **24''** to or between layers **522A''**, **522B''** of building wall **522''**. Such alternative mounting techniques may include glue, sealant or friction fittings wherein a portion of base member **24''** is sized for a friction fit within building recess **523''**. When mounted according to any of these techniques, the substantially planar, vertically and transversely outwardly extending profile of mounting flange **534''** allows mounting flange **534''** to extend between and substantially parallel to layers **522A''**, **522B''** of building wall **522''**.

[0088] Base member **24''** is typically mounted so that building recess **523''** surrounds the portions of its outer surfaces which are interior (see arrow **558''**) of mounting flange **534''**. When base member **24''** is mounted in this manner, the building may then be finished by applying one or more external wall layer(s) **522B''** over the exterior surface of internal wall layer **522A''**. Such external wall layer(s) **522B''** may comprise vinyl siding, wood siding or stucco, for example. External wall layer(s) **522B''** are preferably fabricated, such that, when installed, they extend over mounting flange **534''** and abut against skirt flange **521''**. More specifically, external wall layer(s)

522B'' may abut against the outer transverse surfaces of side portions **539''**, the upper surface of upper portion **538''** and/or the undersurface **544''** of bottom drainage flange **524''**. Upper portion **538''** and bottom drainage flange **524''** are preferably sized such that, after the installation of external wall layer(s) **522B''**, upper portion **538''** and bottom drainage flange **524''** project in an exterior direction past the exterior-most extent of external wall layer **522B''**. Although not necessary for the effective working of the invention, outer drip lip **543''** of bottom drainage flange **524''** may be located in a portion of bottom drainage flange **524''** which is located exterior of the exterior-most extent of external wall layer **522B''**.

[0089] In the illustrated embodiment, bottom drainage flange **524''** projects past the exterior-most extent of external wall layer **522B''**, thereby providing a mechanism for removing moisture from within building wall **522''** and directing moisture away from building recess **523''**. Moisture that is received on bottom drainage flange **524''** is directed downwardly and in an exterior direction by force of gravity past the exterior-most extent of external wall layer **522B''** to the outside of building wall **522''**. Dams **542''** limit the transverse movement of moisture and prevent moisture from escaping transversely from the sides of bottom drainage flange **524''**. Outer drip lip **543''** provides a drip edge to help prevent water droplets from accumulating on bottom drainage flange **524''**.

[0090] Moisture received on mounting flange **534''** may be directed downwardly to bottom drainage flange **524''**. Once received on bottom drainage flange **524''**, such moisture may be directed downwardly and in an exterior direction past the exterior-most extent of external wall layer **522B''** as described above.

[0091] Side portions **539''** of skirt flange **521''** and bottom flange **524''** work together to direct moisture out from within wall **522''** and

away from building recess **523''**. When moisture is received on either side of side portions **539''**, it is directed downwardly onto bottom drainage flange **524''**, where it is directed downwardly and in an exterior direction past the exterior-most extent of external wall layer **522B''** as described above.

[0092] Upper portion **538''** of skirt flange **521''** also provides a mechanism for removing moisture from within building wall **522''** and directing moisture away from building recess **523''**. When moisture is received on upper portion **538''** of skirt flange **521''**, it may be directed by gravity downwardly and in an exterior direction past the exterior-most extent of external wall layer **522B''** to the outside of building wall **522''**. In addition, moisture may travel transversely on upper portion **538''** of skirt flange **521''** until it reaches side portions **539''** of skirt flange **521''**. Moisture reaching side portions **539''** of skirt flange **521''** will be directed downwardly to bottom drainage flange **524''** and then downwardly and in an exterior direction past the exterior-most extent of external wall layer **522B''** as described above.

[0093] Junction box **10''** comprises a top aperture **50''** (Figures 23 and 26), a bottom aperture **30''** (Figure 27), and a back aperture **90''** (Figure 25). Junction box **10''** may also comprise an elongated back aperture **272''** (not shown) and a pair of side apertures **300''**, **302''** (not shown). Preferably, these apertures **50''**, **30''**, **90''**, **272''**, **300''**, **302''** are knock-out apertures and are substantially similar to the corresponding knock-out apertures of junction box **10** described above. Each of these apertures may also comprise a plurality of knock-out elements, such that a variety of sizes of apertures may be formed. In the illustrated embodiment of Figures 23-29, junction box **10''** and its upper aperture **50''** and lower aperture **30''** are shown without concentric flanges **56**, **58** and **36**, **37**, **38**, which respectively surround upper aperture **50** and lower aperture **30** of junction box **10**. However, in the illustrated embodiment of Figures 30A, 30B, upper aperture **50''**

and lower aperture **30''** are shown to comprise concentric flanges **56''**, **58''** and **36''**, **37''**, **38''**. Concentric flanges **56''**, **58''** and **36''**, **37''**, **38''** may be substantially similar and function in a manner that is substantially similar to concentric flanges **56**, **58** and **36**, **37**, **38**.

[0094] As best seen in Figures 25-29, junction box **10''** comprises a hood **560''** which provides a protective covering for a cable or cable conduit (not shown), which may be fed through bottom aperture **30''** into junction box **10''**. Hood **560''** comprises a hood top **562''** which extends downwardly and outwardly from back side **20''** to a hood wall **564''**. In the illustrated embodiment, hood wall **564''** has the shape of a partially cut-away cylinder, the curved surface of which extends outwardly from back side **20''**. Hood wall **564''** extends vertically from hood top **562''** down to hood bottom **566''**, which is located at the bottom edge of back side **20''** (Figure 27). Hood bottom **566''** may be open-ended or may comprise one or more knock-out elements, such that a cable or cable conduit (not shown) may be fed through hood bottom **566''** and bottom aperture **30''** into junction box **10''**. In alternative embodiments (not shown), hood top **562''**, hood wall **564''**, and hood bottom **566''** may have other suitable shapes.

[0095] Other features of junction box **10''** (not shown) may be substantially similar to features of junction box **10** (Figures 8, 11-14). Accordingly, such features of junction box **10''** are not described further herein.

[0096] As will be apparent to those skilled in the art in the light of the foregoing disclosure, many alterations and modifications are possible in the practice of this invention without departing from the spirit or scope thereof. For example:

- Terminal connector platform **204** is not required by the invention. The features of platform **204**, such as stand-off flange **212**, screw

hole **214** and apertures **240** for example, may be formed integrally on inner surface **250** of lid member **26**.

- The illustrated terminal connectors **200**, **202** of Figures 12 and 14 comprise surge protection modules commonly used in the telecommunications industry. However, those skilled in the art will appreciate that many variations of terminal connectors could be mounted to platform **204** or mounted directly on inner surface **250** of lid member **26**. In general, the specific terminal connectors used inside junction box **10** may be varied without departing from the invention. The invention should be understood to accommodate any type of suitable terminal connector that may be mounted on a terminal connector platform or directly on inner surface **250** of lid member **26**.

- In addition to terminal connectors, various other types of electrical components may be housed in junction box **10**. Such other components may include, for example: capacitors, switches, relays, ADSL splitters, HDSL splitters, circuit boards, amplifiers, cable splitters and routers.

- If junction box **10** houses different types of terminal connectors (i.e. terminal connectors different from terminal connectors **200**, **202** of Figures 13 and 14) or other electrical components, junction box **10** may require a modified platform **204**. Those skilled in the art will appreciate that there are many implementations of platform **204**, which may be employed to house alternative or additional terminal connectors or electrical components.

- Locking clasp assembly represents a preferred embodiment of how base flange **76** and lid flange **72** may both be independently locked to, and unlocked from, intermediate clasp member **74**.

Other embodiments are possible. For example, locking screw **89** may be replaced by a conventional screw having a locking pin that may be inserted through its tip to lock intermediate clasp member **74** to base flange **76**.

- Although junction box **10** has been depicted and described as having a dual-locking clasp assembly **70**, dual locking clasp assembly **70** is not necessary. Junction box **10** may include a conventional single locking clasp or a non-locking clasp.

- Similar alterations and modifications as those discussed above may be made to junction box **10'**, to junction box **10''**, and to their respective components.

[0097] Accordingly, the scope of the invention is to be construed in accordance with the substance defined by the following claims.